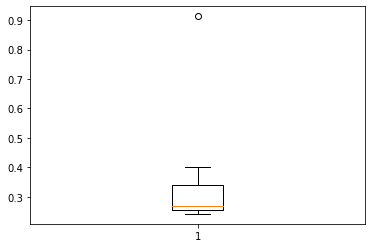
**Topics: Descriptive Statistics and Probability**

1. Look at the data given below. Plot the data, find the outliers and find out

|  |  |
| --- | --- |
| **Name of company** | **Measure X** |
| Allied Signal | 24.23% |
| Bankers Trust | 25.53% |
| General Mills | 25.41% |
| ITT Industries | 24.14% |
| J.P.Morgan & Co. | 29.62% |
| Lehman Brothers | 28.25% |
| Marriott | 25.81% |
| MCI | 24.39% |
| Merrill Lynch | 40.26% |
| Microsoft | 32.95% |
| Morgan Stanley | 91.36% |
| Sun Microsystems | 25.99% |
| Travelers | 39.42% |
| US Airways | 26.71% |
| Warner-Lambert | 35.00% |

**Ans.**

**Average – 33.27%**

**Standard Deviation – 16.94%**

**Variance – 2.87%**



Answer the following three questions based on the box-plot above.

1. What is inter-quartile range of this dataset? (Please approximate the numbers) In one line, explain what this value implies.

**Ans. IQR= Q3-Q1= 12-5 = 7**

**Most of the data is in range between in this IQR**

1. What can we say about the skewness of this dataset?

**Ans. From the above boxplot we can say that it is positively skewed**

1. If it was found that the data point with the value 25 is actually 2.5, how would the new box-plot be affected?

**Ans. There will be no outlier but we have to calculate the mean, median and mode**

**again, to see if there is any change in the data.**



Answer the following three questions based on the histogram above.

1. Where would the mode of this dataset lie?

**Ans. The mode of the dataset would be in between 4 to 7.**

1. Comment on the skewness of the dataset.

**Ans. It is positively skewed.**

1. Suppose that the above histogram and the box-plot in question 2 are plotted for the same dataset. Explain how these graphs complement each other in providing information about any dataset.

**Ans. There will be two explanations for this**

1. **They both are positively skewed**
2. **They both have a same outlier**
3. AT&T was running commercials in 1990 aimed at luring back customers who had switched to one of the other long-distance phone service providers. One such commercial shows a businessman trying to reach Phoenix and mistakenly getting Fiji, where a half-naked native on a beach responds incomprehensibly in Polynesian. When asked about this advertisement, AT&T admitted that the portrayed incident did not actually take place but added that this was an enactment of something that “could happen.” Suppose that one in 200 long-distance telephone calls is misdirected. What is the probability that at least one in five attempted telephone calls reaches the wrong number? (Assume independence of attempts.)

**Ans. => probability of call misdirecting p = 1/200**

**Probability of call not Misdirecting = 1 - 1/200 = 199/200**

**Number of Calls = 5**

**P(x) = ⁿCₓpˣqⁿ⁻ˣ**

**n = 5**

**p = 1/200**

**q = 199/200**

**At least one in five attempted telephone calls reaches the wrong number**

**= 1 - none of the call reaches the wrong number**

**= 1 - P (0)**

**= 1   - ⁵C₀ (1/200) ⁰ (199/200) ⁵⁻⁰**

**= 1 - (199/200) ⁵**

**= 0.02475**

**Therefore, there will be only 2% of chance**

1. Returns on a certain business venture, to the nearest $1,000, are known to follow the following probability distribution

|  |  |
| --- | --- |
| x | P(x) |
| -2,000 | 0.1 |
| -1,000 | 0.1 |
| 0 | 0.2 |
| 1000 | 0.2 |
| 2000 | 0.3 |
| 3000 | 0.1 |

1. What is the most likely monetary outcome of the business venture?

**Ans. It will be $2000 because its occurrence is more.**

1. Is the venture likely to be successful? Explain

**Ans. 0.3+0.2+0.1=0.6**

**0.6\*100=60%**

**There will be 60% probability for the success**

1. What is the long-term average earning of business ventures of this kind? Explain

**Ans. (-2000\*0.1) +(-1000\*0.1) +(0\*0.2) +(1000\*0.2) +(2000\*0.3) +(3000\*0.1) =800**

**$800 will be the long-term average earning of business venture of this kind.**

1. What is the good measure of the risk involved in a venture of this kind? Compute this measure

**Ans. Standard Deviation = 1870.82**

**Variance = 3.500000e+06**

**The high-risk value will be $1870**